

applicant's specification. Applicant's U.S. representative also argued that such a comparison was representative of the closest prior art of record. The following is intended to expand upon the discussion with the examiner.

Water-based inks have become popular for use in inkjet recording. The use of permeability controlling agents such as water-soluble organic solvents can lead to degradation of the aqueous dispersion as well as extraction of a dye from a dye-containing polymer. Accordingly, water-based inks comprising aqueous dispersions of polymer particles having good stability in the presence of a permeability controlling agent are sought.

The claimed invention addresses this problem by providing a water-based ink comprising an aqueous dispersion of polymer particles of a water-insoluble polymer having C₂₀₋₃₀ alkyl groups on its side chain and having an acid value of 30-120 mgKOH/g, and a hydrophobic dye. Applicant has discovered that such a water-insoluble polymer provides for a water-based ink of good stability. Such a water-based ink is nowhere disclosed or suggested in the cited prior art of record.

The rejection of claims 1-3 and 5-17 under 35 U.S.C. §103(a) over Gore et al., U.S. 2003/0055178 in view of Ishizuka et al. U.S. 2002/0025994 and WO 2001/96483 is respectfully traversed.

None of the cited references disclose or suggest improved stability by selection of a polymer particle of a water-insoluble polymer having an alkyl group of 20-30 carbon atoms in its side chain and having an acid value of 30-120 mg KOH/g.

Gore et al. describe dispersions in which the colorant is encapsulated within a polymer particle of polymerized ethyleneically-unsaturated monomers including, but not limited to: (meth)acrylic acid, (meth)acrylamides, alkyl (meth)acrylates, alkenyl (meth)acrylates, aromatic (meth)acrylates, vinyl aromatic monomers, phosphorus-containing compounds such as phosphoethyl (meth)acrylate ("PEM"), vinyl acetates, nitrogen-

containing compounds and their thio-analogs, maleate, mono- and dialkyl esters, maleic acid, fumarates, maleamates and their copolymers with vinyl aromatics, vinyl ethers, vinyl sulfides, and substituted ethylene monomers (paragraph [0034]).

Paragraph [0035] identifies that typical alkyl(meth)acrylates include C₁₋₂₄ alkyl (meth)acrylates, which includes, but are not limited to “low cut” (e.g. C₁₋₆), “mid cut” (e.g. C₇₋₁₅) and high cut” (e.g. C₁₆₋₂₄) alkyl(meth)acrylates. There is nothing from this portion of the disclosure to have selected any one of C₁₋₆, C₇₋₁₅ or C₁₆₋₂₄ alkyl(meth)acrylates. The three groups are equally disclosed.

As to the examples of the reference, example 1 uses methyl methacrylate a C₁ alkyl group side chain. Examples 2 and 3 use acetoacetoxyethyl and allyl methacrylates, C₆ and C₃ alkyl group side chains respectively. Example 4 uses ethyl and methyl methacrylates, C₂ and C₁ alkyl group side chains. The table in example 5 lists a number of PNP compositions identified in terms of monomer abbreviations, none of which contain CEMA or SMA, the only C₁₆₋₂₄ alkyl(meth)acrylates identified by Gore by abbreviation in paragraph [0038]. None of the other examples illustrate a C₁₆₋₂₄ acrylate.

Thus, Gore et al. only provides a generic disclosure of the use of C₁₋₂₄ alkyl (meth)acrylates. As to what actually existed in the prior art, the working examples provide the best evidence as the remaining disclosure is merely speculation as to what may be possible. Toward this end, the working examples only demonstrate C₁, C₂, C₃ and C₆ alkyl methacrylates. This is the true measure of what actually existed in the prior art. Thus the disclosure of Gore et al. is really only suggestive of a generic use of C₁₋₂₄ alkyl acrylates, illustrating C₁₋₃ and C₆ alkyl acrylates.

Applicant’s comparison against C₁, C₂ and C₁₂ alkyl group side chains is clearly sufficient to compare against the closest prior art since it compares the actually demonstrated monomers of the reference as well as an embodiment at C₁₂, which is even closer to the

claimed invention than that which is illustrated in the cited reference. Applicant does not need to compare against subject matter which does not exist in the prior art.

Although evidence of unexpected results must compare the claimed invention with the closest prior art, applicant is not required to compare the claimed invention with subject matter that does not exist in the prior art. *In re Geiger*, 815 F.2d 686, 689, 2 USPQ2d 1276, 1279 (Fed. Cir. 1987) (Newman, J., concurring) (Evidence rebutted *prima facie* case by comparing claimed invention with the most relevant prior art. Note that the majority held the Office failed to establish a *prima facie* case of obviousness.); *In re Chapman*, 357 F.2d 418, 148 USPQ 711 (CCPA 1966) (Requiring applicant to compare claimed invention with polymer suggested by the combination of references relied upon in the rejection of the claimed invention under 35 U.S.C. 103 "would be requiring comparison of the results of the invention with the results of the invention." 357 F.2d at 422, 148 USPQ at 714.) MPEP 716.02(e)III.

Applicant has demonstrated an improvement in printing performance and retention of viscosity by selection of an alkyl group having 20-30 carbon atoms, as compared with C₁₂, C₁ and C₂ polymers. The examiner's attention is again directed to the data appearing in Tables 1-3 on page 26 of the above-identified application. Comparative examples 1 and 4 are demonstrations of C₁₂ polymers, comparative examples 2 and 5 are demonstrations of C₂ polymers and comparative examples 3 and 6 are demonstrations of C₁ polymers. Examples 1 and 2 are a demonstration of a C₂₂ polymer. For the examiner's convenience the data from tables 1-3 is reproduced below:

Table 1

| | Optical Density | Printing Reliability |
|-----------------------|-----------------|--|
| Example 1 | 1.06 | No clogging and no distortion observed |
| Comparative example 1 | 1.05 | No clogging but slight distortion |
| Comparative example 2 | 1.03 | No clogging but slight distortion |
| Comparative example 3 | 1.01 | No clogging but slight distortion |

Table 2

| Example no | Ratio of Retaining Viscosity (%) | | | | |
|------------|----------------------------------|-----------------|-----------------------------------|------------------------------------|---------------|
| | Isopropanol | 2-Pyrrolidinone | Diethylene Glycol Monobutyl Ether | Triethylene Glycol Monobutyl Ether | Acetylenol EH |
| 2 | 98 | 103 | 104 | 100 | 100 |
| Comp. Ex 4 | 125 | 124 | 126 | 136 | 123 |
| Comp. Ex 5 | 129 | 120 | 125 | 120 | 129 |
| Comp. Ex 6 | 132 | 133 | 128 | 130 | 128 |

Table 3

| Example no | Ratio of Retaining Average Particle Diameter (%) | | | | |
|------------|--|-----------------|-----------------------------------|------------------------------------|---------------|
| | Isopropanol | 2-Pyrrolidinone | Diethylene Glycol Monobutyl Ether | Triethylene Glycol Monobutyl Ether | Acetylenol EH |
| 2 | 99 | 102 | 99 | 97 | 104 |
| Comp. Ex 4 | 125 | 142 | 128 | 142 | 127 |
| Comp. Ex 5 | 121 | 136 | 127 | 115 | 120 |
| Comp. Ex 6 | 132 | 146 | 129 | 121 | 124 |

The data illustrates an improved printing reliability in terms of no observed distortion and retention of viscosity and average particle diameter for the C₂₂ alkyl polymer as compared with C₁₂, C₁ and C₂ polymers. As the primary references only broadly suggest an alkyl group of C₁₋₂₄ alkyl ((page 3, paragraph [0035] of Gore et al), there is no expectation of any different result from selection of a C₂₀₋₃₀ alkyl group. As applicant has demonstrated differences in performance resulting from such a selection, the claimed invention is believed to be non-obvious over the cited references. Withdrawal of the rejection based on obviousness is respectfully requested.

The remaining cited references fail to cure the defects of the primary reference in terms of disclosing embodiments which are closer prior art.

Yatake et al. in paragraphs [0152]-[0153] of U.S. 2003/0103462 merely describes the use of polymers of monomers including acryloyl, methacryloyl, vinyl or allyl groups and fails to provide a closer suggestion than Gore et al. of a water-insoluble polymer having an alkyl

group of at least 20-30 carbon atoms on its side chain and an acid value of 30-120 mgKOH/g and a hydrophobic dye.

Ishizuka et al. describes in paragraph [0010] a polymer based on a polymerizable carboxylic acid monomer and fails to provide a closer suggestion than Gore et al. of a water-insoluble polymer having an alkyl group of at least 20-30 carbon atoms on its side chain and an acid value of 30-120 mgKOH/g and a hydrophobic dye.

As applicant has provided a comparison against the closest prior art of record of an improved stability resulting from selection of a C₂₀₋₃₀ alkyl group, the claimed invention is clearly not rendered obvious from this combination of references and withdrawal of the rejection under 35 U.S.C. §103(a) is respectfully requested.

Applicant submits that this application is now in condition for allowance and early notification of such action is earnestly solicited.

Respectfully submitted,

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